

**Second Year Wetland Mitigation Site Monitoring for FAP 322  
(U.S. 51), Macon County, Illinois – 2003**

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**Introduction**

Wetland compensation activity has been initiated along U.S. 51 in Macon County, Illinois. The legal location of the site is NE1/4, SE1/4, Section 9, T. 15 N., R. 2 E. and SE1/4, SE1/4, NE1/4, Section 9, T. 15 N., R. 2 E. (Decatur, IL Quad). Prior to road construction this area had been farmed for over 75 years and cover consisted of corn and beans (Coopridner and Ketzner 2000). The pre-settlement environment consisted of wet and mesic prairie. Presently, the site is surrounded by road embankments and is mostly a depression within the infield of the U.S. 51 – Riley Road interchange. The mitigation site assessment and wetland compensation plan for this area suggested that an emergent wetland plant community (i.e. wet prairie, wet meadow, or marsh) would be the most likely development for this site (Coopridner and Ketzner 2000; IDOT 1996). Directly west of the site, approximately 150 m (500 ft), is the Elwin *Camassia* site (Brooks 1999; IDOT 1996). This site is a mesic to dry-mesic Illinois Natural Areas Inventory site which contains a population of the state endangered wild hyacinth, *Camassia angusta* (Herkert and Ebinger 2002).

According to Coopridner and Ketzner (2000), 0.79 ha (1.95 ac) of this infield was already wetland in 1999. Since then, the site has been shallowly excavated, mostly at the northern end of the infield, creating more low depressional ground to support a wetland. An emergent wetland community (wet prairie/marsh) is planned for this site. Construction of this wetland mitigation site was completed in June 2001. Illinois Natural History Survey (INHS) personnel began field monitoring of this area in 2002 and will continue for five years, as requested by the Illinois Department of Transportation (Brooks 2001). The Illinois State Geological Survey was also tasked to monitor the hydrology of this site. Project goals, objectives, and performance criteria are included in this report, as are monitoring methods, monitoring results, summary information and recommendations.

**Project Goals, Objectives, and Performance Criteria**

Proposed goals and objectives for this wetland mitigation project are based on information contained in the original wetland compensation plan for this site (IDOT 1996). Performance criteria are based on those specified in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and *Guidelines for Developing Mitigation Proposals* (USACOE 1993). Each goal should be attained by the end of the five-year monitoring period. Project goals, objectives and performance criteria are listed below.

**Project Goal #1:** At the end of the five-year monitoring period the created wetland community should be a jurisdictional wetland as defined by current federal standards.

**Objective:** The created wetland should compensate for the loss of wetland.

**Performance Criteria:** The entire created wetland should satisfy the three criteria of the federal wetland definition: dominant hydrophytic vegetation, hydric soils, and wetland hydrology.

- A. Predominance of Hydrophytic Vegetation – More than 50% of the dominant plant species must be hydrophytic.
- B. Presence of Hydric Soils – Hydric soil characteristics should be present, or conditions favorable for hydric soil formation should persist at this site.
- C. Presence of Wetland Hydrology – The compensation area must be either permanently or periodically inundated at average depths less than 2 m (6.6 ft) or have soils that are saturated to the surface for at least 12.5% of the growing season.\*

**Project Goal #2:** A native, non-weedy, emergent wetland community will be created.

**Objective:** Planting the area with high quality native emergent vegetation should reduce the pressures from successional, non-native, weedy species.

**Performance Criteria:** At least 50% of the plant species present should be non-weedy, native, perennial species. Furthermore, none of the dominant plant species may be non-native, cattails, or reed canary grass.

## Methods

Monitoring of this wetland mitigation site began in 2002 and will continue for the standard five-year monitoring period. Illinois Natural History Survey (INHS) personnel will monitor the biological parameters and Illinois State Geological Survey (ISGS) personnel will monitor hydrology. Herbaceous vegetation will be monitored annually using standard sampling techniques (Cox 1985). Transects have been established perpendicular to a baseline running from northeast to southwest. The baseline begins at the ISGS surface water monitoring station (RDS2) on the north end of the site and follows along a bearing of 205° through the middle of the site. Transects are located along this baseline and start at 30 m from RDS2 and continue at 25 m intervals thereafter. Transects will alternate their orientation from the baseline, first running west from the baseline and then running east. Quadrats (1m<sup>2</sup>) will be placed at 5m intervals along each transect, beginning with a quadrat at the baseline. A minimum of 30 1m<sup>2</sup> quadrats will be sampled annually. Results and status of the created wetland site will be submitted to the Illinois Department of Transportation (IDOT) in yearly monitoring reports. The likelihood of meeting the proposed goals and performance criteria will also be addressed. If, at any time during the monitoring period, it appears that the goals/performance criteria will not be

\* In some cases wetland hydrology can be met when a site is inundated or saturated for 5% to 12.5% of the growing season (Environmental Laboratory 1987).

met at the end of the five-year monitoring period, written management recommendations will be made to IDOT in an effort to correct any problems.

### **Floristic Quality Index**

A complete list of all plant species found in the project area will be recorded annually and the Floristic Quality Index (FQI) will be calculated (Swink and Wilhelm 1979 and 1994; Taft *et al.* 1997). The FQI provides a measure of the floristic integrity or level of disturbance of a site. Each native plant species is assigned a rating between 0 and 10 (the Coefficient of Conservatism) that is a subjective indicator of how likely a plant may be found on an undisturbed site in a natural plant community. A plant species that has a low Coefficient of Conservatism (C) is common and is likely to tolerate disturbed conditions; a species with a high C is relatively rare and is likely to require specific, undisturbed habitats. Species not identified to species level are not rated and are not included in the calculations.

To calculate the FQI, first compute the mean C value (also known as mean rated quality),  $mCv = \sum C/N$ , where  $\sum C$  represents the sum of the numerical ratings (C) for all species recorded for a site, and N represents the number of plants on the site. The C value for each species is shown in the species list for the site. Species that are not native to Illinois (indicated by \* in the species list for each site) are not included in the calculations. The FQI for each site is determined by multiplying the mean C value times the square root of N [ $mCv (\sqrt{N})$ ]. An Index score below 10 suggests a site of low natural quality; below 5, a highly disturbed site. An FQI value of 20 or more suggests that a site has evidence of native character and may be considered an environmental asset.

### **Project Goal #1**

Wetland delineation will be completed yearly for all wetland community types at this compensation site. Since accurate boundaries may not be clear until several years of data have been gathered, wetlands will be marked on an aerial photograph only at the end of the five-year monitoring period. In addition, permanent photo stations have been established in the wetland restoration/creation area and photos will be taken annually in order to help monitor changes in the vegetation. Photo stations will be marked on the aerial photograph.

A. Predominance of Hydrophytic Vegetation – The method for determining dominant hydrophytic vegetation is described in Environmental Laboratory (1987) and Federal Interagency Committee for Wetland Delineation (1989). This method is based on aerial coverage estimates for individual plant species. Each of the dominant plant species is assigned a wetland indicator status rating (Reed 1988). Any plant rated facultative or wetter (i.e., FAC, FAC+, FACW-, FACW, FACW+ and OBL) is considered hydrophytic. A predominance of hydrophytic vegetation in the wetland plant community exists if greater than 50% of the dominant species present are hydrophytic.

Dominant hydrophytic vegetation will be determined each year based on the results of systematic plant sampling. Cover of all species in each plot is assigned a cover class according to Daubenmire (1959) (Table 1). Frequency (proportion of quadrats in which a species occurred)

and average cover (calculated using midpoints for each cover class) will be used to compute relative frequency (frequency of a species relative to total observations) and relative cover (cover relative to total observed cover), respectively. These two relative values are averaged to determine the importance value for each species sampled. Importance values will be used to determine dominant species. "Dominant species are the most abundant plant species (when ranked in descending order of abundance and cumulatively totaled) that immediately exceed 50% of the total dominance measure for the stratum, plus any additional species comprising 20% or more of the total dominance measure for the stratum" (FICWD 1989; Tiner 1999).

**Table 1. Cover classes used in vegetation sampling**

Cover Class	Range of Cover (%)	Midpoint of Range (%)
1	0-5	3.0
2	5-25	15.0
3	25-50	37.5
4	50-75	62.5
5	75-95	85.0
6	95-100	97.5
(Daubenmire 1959)		

B. Presence of Hydric Soils – Soils will be examined and described annually. A soil core collected from the same general area of the mitigation site will be examined for the presence of redoximorphic features. A detailed profile description of the soil using Munsell color charts to record soil colors will be included. Soil texture and structure will also be recorded. Hydric soils may develop slowly and characteristics may not be apparent during the first several years after project construction. In the absence of hydric soil indicators at that time, hydrologic data could be used as corroborative evidence that conditions favorable for hydric soil formation are present at the site.

C. Presence of Wetland Hydrology – The ISGS has been tasked to monitor hydrology at the proposed wetland site. To date they have installed two surface water monitoring stations (RDS1 and RDS2), a rain gauge, two surface water staff gauges, and eleven monitoring wells (1S-8S and 10S-12S) (Watson and Sabatini 2002; Watson and Sabatini 2003). ISGS personnel will measure water levels monthly. In addition, INHS scientists will survey the site annually for field indicators of wetland hydrology.

## **Project Goal #2**

A complete species list will be compiled each year and species will be recorded as native or non-native, weedy or non-weedy, and as a perennial, biennial, or an annual. Nativity of plants will be determined by consulting Mohlenbrock (1986). Weedy species, for the purposes of this report, are defined as all non-native species and any native species assigned a Coefficient of Conservatism of 0 or 1 (Taft *et al.* 1997). Species given a C value of 0-1 correspond to Grime's ruderal species (Grime 1974; Grime *et al.* 1988) which include species adapted to frequent or

severe disturbances (Taft *et al.* 1997). Gleason and Cronquist (1991), Taft *et al.* (1997), and USDA, NRCS (2002) will be the primary sources used to determine whether a species is perennial, biennial, or annual.

## Results

**Floristic Quality Index:** The Floristic Quality Index was calculated for this site using native species only. The wetland creation/restoration site had a FQI of 13.6 and a mean C value of 2.2. These values are indicative of fair natural quality. The upland buffer around the wetland site had a FQI of 6.8 and a mean C value of 1.7. These values are characteristic of poor natural quality. A total of 38 native species were found in the wetland community with a few species indicative of higher natural quality being present. These include: *Asclepias incarnata*, *Lobelia cardinalis*, *Lobelia siphilitica*, *Scirpus tabernaemontanii*, and *Sparganium eurycarpum*. Summary information for the created wetland site is given in Table 2.

**Table 2. Summary table for FAP 322 wetland monitoring site.**

Total Species Richness	51
Native Species Richness	38
% Native	75% (38/51)
% Non-weedy	43% (22/51)
% Perennial	47% (24/51)
% Native, Non-weedy, and perennial	29% (15/51)
Mean Conservatism (C)	2.2
Floristic Quality Index (FQI)	13.6
% Wetland Species (FAC to OBL)	78% (40/51)

**Project Goal #1** At the end of the five year monitoring period the created wetland community should be a jurisdictional wetland as defined by current federal standards.

A. Predominance of Hydrophytic Vegetation – The performance criterion requires that greater than 50% of the dominant plant species be hydrophytic. Results for 2003 indicate that the dominant herbaceous species are *Amaranthus tuberculatus* (OBL), *Echinochloa muricata* (OBL), and *Typha angustifolia* (OBL) (Table 3). Greater than 50% (100%) of the dominant plant species are hydrophytic; therefore, this site meets the criterion for predominance of hydrophytic vegetation.

**Table 3. FAP 322 (U.S. 51) Wetland Mitigation Site vegetation sampling data including frequency, cover, and importance value for all species sampled in 2003.**

Species	Indicator	Frequency	Relative Frequency	Cover	Relative Cover	Importance Value	Trend
<b><i>Echinochloa muricata</i></b>	OBL	0.92	20.00	44.65	57.78	38.89	↑
<b><i>Typha angustifolia</i></b>	OBL	0.38	8.26	7.11	9.20	8.73	↑
<b><i>Amaranthus tuberculatus</i></b>	OBL	0.44	9.57	3.95	5.11	7.34	↓
<i>Ammania coccinea</i>	OBL	0.52	11.30	2.07	2.68	6.99	↑
<i>Polygonum persicaria</i>	FACW	0.44	9.57	2.03	2.63	6.10	↑
<i>Scirpus tabernaemontani</i>	OBL	0.19	4.13	2.73	3.53	3.83	↑
<i>Cyperus esculentus</i>	FACW	0.17	3.70	2.30	2.98	3.34	↓
<i>Xanthium strumarium</i>	FAC	0.19	4.13	1.80	2.33	3.23	↑
<i>Potamogeton pectinatus</i>	OBL	0.11	2.39	2.54	3.29	2.84	new
<i>Hibiscus trionum</i>	UPL	0.20	4.35	0.51	0.66	2.50	↓
<i>Sida spinosa</i>	FACU	0.17	3.70	0.63	0.82	2.26	↓
<i>Asclepias incarnata</i>	OBL	0.16	3.48	0.59	0.76	2.12	↑
<i>Leersia oryzoides</i>	OBL	0.06	1.30	1.29	1.67	1.49	↑
<i>Abutilon theophrasti</i>	FACU-	0.11	2.39	0.27	0.35	1.37	↓
<i>Typha latifolia</i>	OBL	0.05	1.09	0.86	1.11	1.10	new
<i>Festuca pratensis</i>	FACU-	0.02	0.43	1.33	1.72	1.08	↑
<i>Cyperus acuminatus</i>	OBL	0.05	1.09	0.66	0.85	0.97	↓
<i>Bidens cernua</i>	OBL	0.05	1.09	0.51	0.66	0.87	new
<i>Rumex crispus</i>	FAC+	0.05	1.09	0.12	0.16	0.62	↑
<i>Polygonum lapathifolium</i>	FACW+	0.05	1.09	0.12	0.16	0.62	new
<i>Coreopsis tinctoria</i>	FAC-	0.03	0.65	0.27	0.35	0.50	↓
<i>Hordeum jubatum</i>	FAC+	0.03	0.65	0.27	0.35	0.50	new
<i>Chamaesyce humistrata</i>	FACW	0.03	0.65	0.08	0.10	0.38	↑
<i>Ipomaea lacunosa</i>	FACW	0.03	0.65	0.08	0.10	0.38	↓
<i>Juncus torreyi</i>	FACW	0.03	0.65	0.08	0.10	0.38	↑
<i>Sparganium eurycarpum</i>	OBL	0.02	0.43	0.23	0.30	0.37	new
<i>Chamaesyce nutans</i> *	FACU-	0.02	0.43	0.04	0.05	0.24	↓
<i>Cyperus erythrorhizos</i>	OBL	0.02	0.43	0.04	0.05	0.24	new
<i>Eleocharis erythropoda</i>	OBL	0.02	0.43	0.04	0.05	0.24	↓
<i>Polygonum pensylvanicum</i>	FACW+	0.02	0.43	0.04	0.05	0.24	↓
<i>Polygonum ramosissimum</i>	FAC-	0.02	0.43	0.04	0.05	0.24	new
bare ground				45.43			↑
		4.60	100.00	77.28	100.00	100.00	

Dominant species are in bold

\* updated taxonomy: *Chamaesyce nutans* is the correct name for *Chamaesyce maculata* of 2002.

B. Presence of Hydric Soils – The performance criterion requires that hydric soil characteristics be present, or conditions favorable for hydric soil formation should persist. The soils on this site in 1999 were mapped as Drummer silty clay loam and Flanagan silt loam (Coopridge and Ketzner 1999). Since then, some of the non-hydric parts of this site have been excavated and altered to lower the surface. This is most evident in the northern end of the site where the substratum of the somewhat poorly drained soil (Flanagan) is exposed leading to the appearance of weak redox features at the surface. Over the last year or so these soils have started to develop characteristics of their own based on their new pedogenic conditions, therefore expanding the hydric soil boundary. At the time of the field visit much of the site was inundated. A typical pedon is described below.

**Table 4. Description of the wetland soils at the FAP 322 wetland monitoring site.**

Depth(in)	Matrix Color	Concentrations	Depletions	Texture	Structure
0-6	10YR 2/1			Silty Clay Loam	Sub-Blocky
6-26	10YR 2/1		2.5Y 5/1	Silty Clay Loam	Sub-Blocky
26-40	5Y 4.5/1.5	7.5YR 5/8	5Y 5/1	Silty Clay Loam	Massive
40-51	2.5Y 2.5/1	10YR 5/8	2.5Y 5/2	Silty Clay Loam to Clay Loam	Massive

There are a few areas to the north and south of the hydric soils and along the edges that have very little chance of becoming hydric due to their landscape position. An average pedon for the drier soils around the edge is also described below.

**Table 5. Description of the non-wetland soils at the FAP 322 wetland monitoring site.**

Depth(in)	Matrix Color	Concentrations	Depletions	Texture	Structure
0-6	10YR 2/1	7.5 YR 5/8		Silty Clay Loam	Angular Blocky to Platy
6-13	10YR 6/6	10 YR 4/6		Silty Clay Loam	Weak Sub-Blocky to Massive

C. Presence of Wetland Hydrology – The performance criterion requires that the compensation area must be either permanently or periodically inundated at average depths less than 2m (6.6 ft) or have soils that are saturated to the surface for at least 12.5% of the growing season. The ISGS initiated water level monitoring at this site in September 2000. Their findings for 2003 indicate that 2.6 ha (6.3 ac) out of a total site area of approximately 4.7 ha (11.6 ac) conclusively satisfied the wetland hydrology criterion (Watson and Sabatini 2003).

During visits to the site, the following indicators of hydrology were present: areas of inundation with truly aquatic species (*Potamogeton pectinatus*), algal mats, mud cracks, and some areas of surface or near surface saturation. As mentioned in Watson and Sabatini (2002), there are subtle topographic “high spots” present within this site that probably will not become jurisdictional. Future monitoring activities will be needed to make a conclusive determination and to establish extent of the wetland area.

Figure 1. 2003 aerial extent of wetland hydrology for FAP 322 wetland monitoring site  
(from ISGS, Watson and Sabatini 2003)

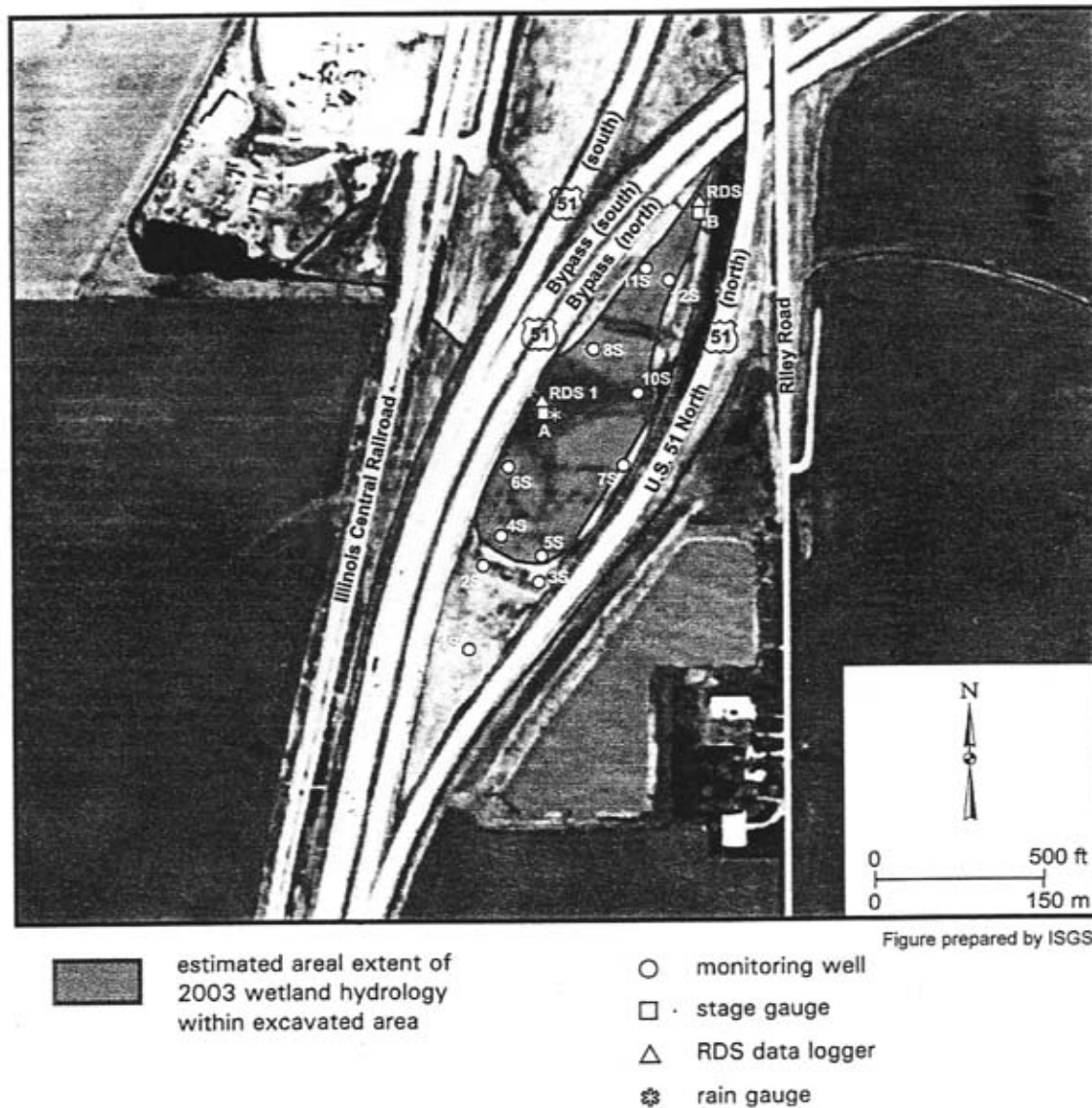


Figure prepared by ISGS.



**Project Goal #2:** A native, non-weedy, emergent wetland community will be created.

Many weedy native and non-native species were present during the second year of sampling. Thirty-eight out of fifty-one (75%) plant species found at this site were native, only twenty-two (43%) species are considered non-weedy, and twenty-four (47%) were perennials. When combined only 29% (15/51) of the species found at this wetland site were native, non-weedy, and perennial. The vegetation present at this site continues to consist of mostly weedy early successional native and non-native species. Furthermore, the second most dominant species is *Typha angustifolia*, the non-native narrow leaf cattail.

### Summary and Recommendations

**Floristic Quality Index** – The FQI increased dramatically since the first year of monitoring (Marcum *et al.* 2002). The FQI score for this wetland mitigation site went from 7.8 in 2002 to 13.6 in 2003. Likewise, the mean C value increased from 1.6 up to 2.2. These values are indicative of fair natural quality. The vegetation at this site is still becoming established and, as is typical for recently disturbed areas, the naturally occurring vegetation continues to be largely made up of weedy, early successional native and non-native species. Over time these species will likely be replaced by more conservative, perennial species that will form a more stable plant community. If that happens, the Floristic Quality Index and the mean C value should continue to rise. It is recommended, however, that additional emergent hydrophytes be planted at this wetland creation to further insure that a high quality wetland community is created. A list of possible additions to the site is included in Table 6 below. These species are all known from this county and are suitable for wet prairie/marsh plant communities. Furthermore, the wetland compensation plan (IDOT 1996) states that the created wetland should be aesthetically appealing from the road. These species would help in this regard as well. Showy mesic to dry prairie species could also be planted in the buffer surrounding the excavated basin. *Andropogon gerardii*, *Eryngium yuccifolium*, *Liatris aspera*, *Liatris pycnostachya*, *Silphium laciniatum*, *Silphium terebinthinaceum*, and *Sorghastrum nutans* might be considered.

**Project Goal # 1** – At the end of a five-year monitoring period the created wetland community should be a jurisdictional wetland as defined by current federal standards. The performance criterion requires that greater than 50% of the dominant plant species be hydrophytic, that hydric soil characteristics be present, or conditions favorable for hydric soil formation should persist, and that the compensation area must be either permanently or periodically inundated at average depths less than 2m (6.6 ft) or have soils that are saturated to the surface for at least 12.5% of the growing season. In 2003, this site exhibited dominant hydrophytic vegetation and hydric soils or conditions favorable for hydric soil development appear to be present within the excavated portion of the infield. Furthermore, Watson and Sabatini (2003) found that approximately 2.6 ha (6.3 ac) conclusively satisfied the wetland hydrology criterion. In 2002, the area of wetland hydrology was somewhat larger, 3.0 ha (7.4 ha) (Watson and Sabatini 2002). It appears, however, that the actual extent of wetland coverage at this site might be less than 2.6 ha. A few areas that have satisfied wetland hydrology have yet to develop hydrophytic vegetation. Future data, from vegetation sampling, soil investigations, and hydrologic monitoring will be used to determine the aerial extent of wetland at this site.

**Project Goal #2** – A native, non-weedy, emergent wetland community will be created. The performance criterion for this goal states that 1.) at least 50% of the plant species should be non-weedy, native, perennial species and 2.) none of the dominants may be non-native, cattails, or reed canary grass. Neither part of this performance criterion was met in 2003. After the second year of monitoring, only 29% (15/51) of the species present were non-weedy, native perennials. To help insure the creation of a high quality wetland we suggest planting or seeding of more conservative species at this site. A number of suggested species are listed below.

**Table 6. Plant species recommended for wet prairie/marsh planting at the FAP 322 (U.S. 51) wetland mitigation site.**

Scientific Name	Common Name	Stratum	Wetland Indicator Status	C♦	Perennial, Annual, Biennial
<i>Boltonia asteroides</i>	false aster	herb	FACW	5	Perennial
<i>Calamagrostis canadensis</i>	bluejoint grass	herb	OBL	3	Perennial
<i>Carex</i> spp.	sedge	herb	----	---	Perennial
<i>Cassia marilandica</i>	Maryland senna	herb	FACW	4	Perennial
<i>Cicuta maculata</i>	water hemlock	herb	OBL	4	Biennial
<i>Eupatorium maculatum</i>	spotted Joe-Pye weed	herb	OBL	5	Perennial
<i>Eupatorium perfoliatum</i>	common boneset	herb	FACW+	4	Perennial
<i>Helenium autumnale</i>	autumn sneezeweed	herb	FACW+	3	Perennial
<i>Hibiscus laevis</i>	halberd-leaved rose mallow	herb	OBL	4	Perennial
<i>Iris shrevei</i>	southern blue flag	herb	OBL	5	Perennial
<i>Lythrum alatum</i>	winged loosestrife	herb	OBL	5	Perennial
<i>Mimulus alatus</i>	winged monkey flower	herb	OBL	6	Perennial
<i>Mimulus ringens</i>	monkey flower	herb	OBL	5	Perennial
<i>Polygonum amphibium</i>	water smartweed	herb	OBL	3	Perennial
<i>Pycnanthemum virginianum</i>	common mountain mint	herb	FACW+	5	Perennial
<i>Sagittaria latifolia</i>	arrowhead	herb	OBL	4	Perennial
<i>Sium suave</i>	water parsnip	herb	OBL	5	Perennial
<i>Spartina pectinata</i>	freshwater cord grass	herb	FACW+	4	Perennial
<i>Vernonia fasciculata</i>	common ironweed	herb	FACW	5	Perennial

♦Coefficient of Conservatism (Taft *et al.* 1997)

All three dominants (*Amaranthus tuberculatus*, *Echinochloa muricata*, and *Typha angustifolia*) at this site are considered to be weedy. One of these, the non-native narrow-leaf cattail (*Typha angustifolia*), is a weedy, obligate (OBL) wetland species and is likely to become more abundant if management techniques are not employed (Apfelbaum 1985). The abundance of this aggressive, persistent weed will be monitored. Management of this area by herbicide or other methods appears to be necessary if this project goal is to be met. Weller (1975) and Sale and Wetzel (1983) found cutting cattail prior to flooding achieved good control. Applied Ecological Services and All Services Company (1985) had success with wick and spray applications of Roundup followed by manual clipping of cattail stems. There treatment was done when cattail seeds were just at the ripening stage.

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## **Appendix 1. Wetland Determination Forms**

## ROUTINE ON-SITE WETLAND DETERMINATION

Site 1 (page 1 of 4)

**Field Investigators:** Marcum & Kurylo

**Date:** 11 July and 5 August, 2003

**State:** Illinois

**Site Name:** Wet Meadow/Marsh

**Legal Description:** NE1/4, NE1/4, SE1/4, Section 9, T. 15 N., R. 2 E. and SE1/4, SE1/4, NE1/4, Section 9, T. 15 N., R. 2 E.

**Location:** This wet meadow/marsh is located approximately 1 mile south of Elwin, IL. It is primarily within the north half of the south infield at the U.S. Route 51-Riley Road interchange.

**Project Name:** FAP 322 (U.S. 51)

**County:** Macon

Do normal environmental conditions exist at this site? Yes: X No:

Has the vegetation, soils, or hydrology been significantly disturbed? Yes: X\* No:

\* This site is a recently excavated depression, created for mitigation purposes.

### VEGETATION

Dominant Plant Species	Indicator Status	Stratum
1. <i>Amaranthus tuberculatus</i>	OBL	herb
2. <i>Echinochloa muricata</i>	OBL	herb
3. <i>Typha angustifolia</i>	OBL	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 100%

**Hydrophytic vegetation:** Yes: X No:

**Rationale:** Greater than 50% of the dominants are OBL, FACW, FAC+, or FAC.

### SOILS

Series and phase: Drummer silty clay loam.

On county hydric soils list? Yes: X No:

Is the soil a histosol? Yes: No: X

Histic epipedon present? Yes: No: X

Redox Concentrations? Yes: X No: Color: 7.5YR 5/8

Redox Depletions? Yes: X No: Color: 2.5Y 5/1, 5Y 5/1

Matrix color: 10YR 2/1 over 5Y 4.5/1.5

Other indicators: Depressional area.

**Hydric soils?** Yes: X No:

**Rationale:** This soil has an iron depleted matrix with iron depletions and concentrations starting below the mollic epipedon and continuing down the profile. Therefore this soil is hydric. This soil also met the F3 hydric soil indicator from the NRCS.

**ROUTINE ON-SITE WETLAND DETERMINATION**  
Site 1 (page 2 of 4)

**Field Investigators:** Marcum & Kurylo

**Date:** 11 July and 5 August, 2003

**State:** Illinois

**Site Name:** Wet Meadow/Marsh

**Legal Description:** NE1/4, NE1/4, SE1/4, Section 9, T. 15 N., R. 2 E. and SE1/4, SE1/4, NE1/4, Section 9, T. 15 N., R. 2 E.

**Location:** This wet meadow/marsh is located approximately 1 mile south of Elwin, IL. It is primarily within the north half of the south infield at the U.S. Route 51-Riley Road interchange.

**Project Name:** FAP 322 (U.S. 51)  
**County:** Macon

**HYDROLOGY**

Inundated: Yes: X (in part) No: Depth of standing water: up to 0.23 m (9 in)

Depth to saturated soil: saturated to surface.

Overview of hydrological flow through the system: This site is located in a depression surrounded by highway embankments. Water enters this site via precipitation, sheet flow from adjacent higher ground (road embankments), and drainage from a culvert under U.S. 51. Water leaves the site primarily via evapotranspiration and slowly through soil infiltration.

Size of watershed: Approximately 11.17 ha (27.6 ac) (IDOT 1996).

Other field evidence observed: This site has been excavated to hold water for longer periods. Areas of inundation, bare areas indicating ponded water, algal mats, and mud cracks were observed at this site.

**Wetland hydrology:** Yes: X No:

**Rationale:** A depressional landscape position and field evidence of saturation suggest that this site is saturated long enough during the growing season to meet the wetland hydrology criterion. This is supported by ISGS well data for this site. Watson and Sabatini (2003) concluded that 2.6 ha (6.3 ac) conclusively satisfied the wetland hydrology criterion in 2003.

**DETERMINATION AND RATIONALE:**

**Is the site a wetland?**  
**Rationale for decision:**

Yes: X No:

Dominant hydrophytic vegetation is already in place at this site and wetland hydrology appears to be present within the excavated depression. Hydric soils are present in part while conditions favorable for hydric soil development are present throughout the depression. This site is well on the way to becoming a wetland. The total extent of the wetland will be determined at the end of the five-year monitoring period.



# ROUTINE ON-SITE WETLAND DETERMINATION Site 1 (page 3 of 4)

**Field Investigators:** Marcum & Kurylo

**Date:** 11 July and 5 August, 2003

**State:** Illinois

**Site Name:** Wet Meadow/Marsh

**Legal Description:** NE1/4, NE1/4, SE1/4, Section 9, T. 15 N., R. 2 E. and SE1/4, SE1/4, NE1/4, Section 9, T. 15 N., R. 2 E.

**Location:** This wet meadow/marsh is located approximately 1 mile south of Elwin, IL. It is primarily within the north half of the south infield at the U.S. Route 51-Riley Road interchange.

**Project Name:** FAP 322 (U.S. 51)  
**County:** Macon

## SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator Status	C ♦	Perennial, Annual, Biennial
<i>Abutilon theophrasti</i>	velvet-leaf	herb	FACU-	*	Annual
<i>Acer saccharinum</i>	silver maple	herb	FACW	1	Perennial
<i>Agrostis hyemalis</i>	hair grass	herb	FAC-	1	Perennial
<i>Amaranthus tuberculatus</i>	tall waterhemp	herb	OBL	1	Annual
<i>Ambrosia artemesiifolia</i>	common ragweed	herb	FACU	0	Annual
<i>Ammannia coccinea</i>	long-leaved ammannia	herb	OBL	5	Annual
<i>Asclepias incarnata</i>	swamp milkweed	herb	OBL	4	Perennial
<i>Aster simplex</i>	panicled aster	herb	FACW	3	Perennial
<i>Bidens cernua</i>	nodding beggar's ticks	herb	OBL	2	Annual
<i>Bidens connata</i>	purplestem beggar's ticks	herb	OBL	2	Annual
<i>Carex vulpinoidea</i>	fox sedge	herb	OBL	3	Perennial
<i>Chamaesyce humistrata</i>	milk spurge	herb	FACW	1	Annual
<i>Chamaesyce nutans</i>	nodding spurge	herb	FACU-	0	Annual
<i>Coreopsis tinctoria</i>	golden coreopsis	herb	FAC-	*	Annual
<i>Cyperus acuminatus</i>	taperleaf flat sedge	herb	OBL	2	Annual
<i>Cyperus erythrorhizos</i>	red-rooted sedge	herb	OBL	1	Annual
<i>Cyperus esculentus</i>	yellow nut-sedge	herb	FACW	0	Perennial
<i>Echinochloa muricata</i>	barnyard grass	herb	OBL	0	Annual
<i>Eleocharis erythropoda</i>	red-rooted spike rush	herb	OBL	3	Perennial
<i>Eupatorium serotinum</i>	late boneset	herb	FAC+	1	Perennial
<i>Festuca pratensis</i>	meadow fescue	herb	FACU-	*	Perennial
<i>Hibiscus trionum</i>	flower-of-an-hour	herb	UPL	*	Annual
<i>Hordeum jubatum</i>	squirrel-tail grass	herb	FAC+	*	Perennial
<i>Ipomoea lacunosa</i>	small white morning-glory	herb	FACW	1	Annual
<i>Iva annua</i>	marsh elder	herb	FAC	0	Annual
<i>Juncus interior</i>	inland rush	herb	FAC+	3	Perennial
<i>Juncus torreyi</i>	Torrey's rush	herb	FACW	3	Perennial
<i>Lactuca serriola</i>	prickly lettuce	herb	FAC	*	Biennial
<i>Leersia oryzoides</i>	rice cutgrass	herb	OBL	3	Perennial
<i>Lindernia dubia</i>	false pimpernel	herb	OBL	5	Annual

Species list continued on following page.

# ROUTINE ON-SITE WETLAND DETERMINATION Site 1 (page 4 of 4)

**Field Investigators:** Marcum & Kurylo

**Date:** 11 July and 5 August, 2003

**State:** Illinois

**Site Name:** Wet Meadow/Marsh

**Legal Description:** NE1/4, NE1/4, SE1/4, Section 9, T. 15 N., R. 2 E. and SE1/4, SE1/4, NE1/4, Section 9, T. 15 N., R. 2 E.

**Location:** This wet meadow/marsh is located approximately 1 mile south of Elwin, IL. It is primarily within the north half of the south infield at the U.S. Route 51-Riley Road interchange.

**Project Name:** FAP 322 (U.S. 51)  
**County:** Macon

## SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C ♦	
<i>Lobelia cardinalis</i>	cardinal-flower	herb	OBL	6	Perennial
<i>Lobelia siphilitica</i>	blue cardinal-flower	herb	FACW+	4	Perennial
<i>Melilotus alba</i>	white sweet clover	herb	FACU	*	Biennial
<i>Melilotus officinalis</i>	yellow sweet clover	herb	FACU	*	Biennial
<i>Polygonum hydropiper</i>	common smartweed	herb	OBL	*	Annual
<i>Polygonum lapathifolium</i>	curttop lady's thumb	herb	FACW+	0	Annual
<i>Polygonum pensylvanicum</i>	giant smartweed	herb	FACW+	1	Annual
<i>Polygonum persicaria</i>	spotted lady's thumb	herb	FACW	*	Annual
<i>Polygonum ramosissimum</i>	bushy knotweed	herb	FAC-	3	Annual
<i>Populus deltoides</i>	eastern cottonwood	shrub, herb	FAC+	2	Perennial
<i>Potamogeton pectinatus</i>	comb pondweed	herb	OBL	5	Perennial
<i>Rorippa sessiliflora</i>	sessile-flowered cress	herb	OBL	3	Annual
<i>Rumex altissimus</i>	pale dock	herb	FACW-	2	Perennial
<i>Rumex crispus</i>	curly dock	herb	FAC+	*	Perennial
<i>Salix nigra</i>	black willow	shrub	OBL	3	Perennial
<i>Scirpus tabernaemontanii</i>	great bulrush	herb	OBL	4	Perennial
<i>Sida spinosa</i>	prickly sida	herb	FACU	*	Annual
<i>Sparganium eurycarpum</i>	burreed	herb	OBL	5	Perennial
<i>Typha angustifolia</i>	narrow-leaved cattail	herb	OBL	*	Perennial
<i>Typha latifolia</i>	cattail	herb	OBL	1	Perennial
<i>Xanthium strumarium</i>	cocklebur	herb	FAC	0	Annual

♦ Coefficient of Conservatism (Taft *et al.* 1997)  
\*Non-native species

mean C value (mCv) =  $\sum C/N = 84/38 = 2.2$   
FQI = mCv ( $\sqrt{N}$ ) =  $2.2(\sqrt{38}) = 13.6$

Determined by: Paul Marcum (vegetation and hydrology)  
Jessica Kurylo (soils and hydrology)  
Illinois Natural History Survey  
Center for Wildlife Ecology  
607 East Peabody Drive  
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(217) 333-8459 (Marcum)

## ROUTINE ON-SITE WETLAND DETERMINATION

Site 2 (page 1 of 4)

**Field Investigators:** Marcum & Kurylo

**Date:** 11 July and 5 August, 2003

**State:** Illinois

**Site Name:** Non-native Grassland

**Legal Description:** NE1/4, SE1/4, Section 9, T. 15 N., R. 2 E. and SE1/4, SE1/4, NE1/4, Section 9, T. 15 N., R. 2 E.

**Location:** This non-native grassland is located approximately 1 mile south of Elwin, IL. It is primarily within the south half of the south infield at the U.S. Route 51-Riley Road interchange. This site also extends around site #1 in the north section of the infield.

**Project Name:** FAP 322 (U.S. 51)

**County:** Macon

Do normal environmental conditions exist at this site? Yes: X No:  
Has the vegetation, soils, or hydrology been significantly disturbed? Yes: No: X

### VEGETATION

Dominant Plant Species	Indicator Status	Stratum
1. <i>Coreopsis tinctoria</i>	FAC-	herb
2. <i>Erigeron annuus</i>	FAC-	herb
3. <i>Festuca pratensis</i>	FACU-	herb
4. <i>Melilotus alba</i>	FACU	herb
5. <i>Melilotus officinalis</i>	FACU	herb

Percentage of dominant species that are OBL, FACW, FAC+, or FAC: 0%

**Hydrophytic vegetation:** Yes: No: X

**Rationale:** Less than 50% of the dominants are OBL, FACW, FAC+, or FAC.

### SOILS

Series and phase: Flanagan silt loam.

On county hydric soils list? Yes: No: X

Is the soil a histosol? Yes: No: X

Histic epipedon present? Yes: No: X

Redox Concentrations? Yes: X No: Color: 7.5YR 5/8 & 10YR 5/8

Redox Depletions? Yes: No: X

Matrix color: 10YR 2/1 over 10YR 6/6

Other indicators: Higher topographic position relative to wetland site.

**Hydric soils?** Yes: No: X

**Rationale:** A soil matrix color with a chroma greater than 2 is too bright to be considered hydric.

## ROUTINE ON-SITE WETLAND DETERMINATION

Site #2 (page 2 of 4)

**Field Investigators:** Marcum & Kurylo

**Date:** 11 July and 5 August, 2003

**State:** Illinois

**Site Name:** Non-native Grassland

**Legal Description:** NE1/4, SE1/4, Section 9, T. 15 N., R. 2 E. and SE1/4, SE1/4, NE1/4, Section 9, T. 15 N., R. 2 E.

**Location:** This non-native grassland is located approximately 1 mile south of Elwin, IL. It is primarily within the south half of the south infield at the U.S. Route 51-Riley Road interchange. This site also extends around site #1 in the north section of the infield.

**Project Name:** FAP 322 (U.S. 51)

**County:** Macon

### HYDROLOGY

Inundated: Yes: No: X Depth of standing water: NA

Depth to saturated soil: > 1.2 m (48 in)

Overview of hydrological flow through the system: This site is at a slightly to noticeably higher elevation than site #1. It is level to slightly sloping. Water enters this site via precipitation and sheet flow from adjacent higher ground. Water leaves the site via evapotranspiration, soil infiltration, and through sheet flow into site #1.

Size of watershed: Approximately 11.17 ha (27.6 ac) (IDOT 1996).

Other field evidence observed: none

**Wetland hydrology:** Yes: No: X

**Rationale:** Field observations suggest that this site is both too high of elevation and too sloping to satisfy the wetland hydrology criterion. In our opinion, the site is not saturated long enough during the growing season to meet the wetland hydrology criterion.

### DETERMINATION AND RATIONALE:

**Is the site a wetland?**

Yes: No: X

**Rationale for decision:**

Dominant hydrophytic vegetation, hydric soils, and wetland hydrology were all absent; therefore, this site is not a wetland. The National Wetland Inventory did not code this site as a wetland.

Determined by: Paul Marcum (vegetation and hydrology)  
Jessica Kurylo (soils and hydrology)  
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(217) 333-8459 (Marcum)

## ROUTINE ON-SITE WETLAND DETERMINATION

Site #2 (page 3 of 4)

**Field Investigators:** Marcum & Kurylo

**Date:** 11 July and 5 August, 2003

**State:** Illinois

**Site Name:** Non-native Grassland

**Legal Description:** NE1/4, SE1/4, Section 9, T. 15 N., R. 2 E. and SE1/4, SE1/4, NE1/4, Section 9, T. 15 N., R. 2 E.

**Location:** This non-native grassland is located approximately 1 mile south of Elwin, IL. It is primarily within the south half of the south infield at the U.S. Route 51-Riley Road interchange. This site also extends around site #1 in the north section of the infield.

**Project Name:** FAP 322 (U.S. 51)

**County:** Macon

### SPECIES LIST

Scientific name	Common name	Stratum	Wetland indicator status	C ♦
<i>Abutilon theophrasti</i>	velvet-leaf	herb	FACU-	*
<i>Ambrosia artemisiifolia</i>	common ragweed	herb	FACU	0
<i>Ambrosia trifida</i>	giant ragweed	herb	FAC+	0
<i>Asclepias incarnata</i>	swamp milkweed	herb	OBL	4
<i>Asclepias syriaca</i>	common milkweed	herb	UPL	0
<i>Aster pilosus</i>	hairy aster	herb	FACU+	0
<i>Cichorium intybus</i>	blue sailor's	herb	UPL	*
<i>Cirsium discolor</i>	pasture thistle	herb	UPL	3
<i>Conyza canadensis</i>	horseweed	herb	FAC-	0
<i>Coreopsis grandiflora</i>	large-flowered coreopsis	herb	UPL	*
<i>Coreopsis tinctoria</i>	golden coreopsis	herb	FAC-	*
<i>Cyperus acuminatus</i>	taperleaf flat sedge	herb	OBL	2
<i>Daucus carota</i>	Queen Anne's lace	herb	UPL	*
<i>Dyssodia papposa</i>	fetid marigold	herb	UPL	*
<i>Echinacea purpurea</i>	broad-leaved purple coneflo	herb	UPL	6
<i>Erigeron annuus</i>	annual fleabane	herb	FAC-	1
<i>Eupatorium serotinum</i>	late boneset	herb	FAC+	1
<i>Festuca pratensis</i>	meadow fescue	herb	FACU-	*
<i>Geranium maculatum</i>	wild geranium	herb	FACU	4
<i>Hibiscus trionum</i>	flower-of-an-hour	herb	UPL	*
<i>Hordeum jubatum</i>	squirrel-tail	herb	FAC+	*
<i>Ipomoea lacunosa</i>	small white morning-glory	herb	FACW	1
<i>Lactuca serriola</i>	prickly lettuce	herb	FAC	*
<i>Medicago sativa</i>	alfalfa	herb	UPL	*
<i>Melilotus alba</i>	white sweet clover	herb	FACU	*
<i>Melilotus officinalis</i>	yellow sweet clover	herb	FACU	*
<i>Pastinaca sativa</i>	parsnip	herb	UPL	*
<i>Plantago rugelii</i>	red-stalked plantain	herb	FAC	0
<i>Polygonum persicaria</i>	spotted lady's thumb	herb	FACW	*

Species list continued on following page.

# ROUTINE ON-SITE WETLAND DETERMINATION

Site #2 (page 4 of 4)

**Field Investigators:** Marcum & Kurylo

**Date:** 11 July and 5 August, 2003

**State:** Illinois

**Site Name:** Non-native Grassland

**Legal Description:** NE1/4, SE1/4, Section 9, T. 15 N., R. 2 E. and SE1/4, SE1/4, NE1/4, Section 9, T. 15 N., R. 2 E.

**Location:** This non-native grassland is located approximately 1 mile south of Elwin, IL. It is primarily within the south half of the south infield at the U.S. Route 51-Riley Road interchange. This site also extends around site #1 in the north section of the infield.

**Project Name:** FAP 322 (U.S. 51)

**County:** Macon

## SPECIES LIST (continued)

Scientific name	Common name	Stratum	Wetland indicator status	C ♦
<i>Ratibida columnifera</i>	long-headed coneflower	herb	UPL	*
<i>Ratibida pinnata</i>	drooping coneflower	herb	UPL	4
<i>Rumex crispus</i>	curly dock	herb	FAC+	*
<i>Solidago canadensis</i>	Canada goldenrod	herb	FACU	1
<i>Sonchus oleraceus</i>	common sowthistle	herb	FACU	*
<i>Trifolium hybridum</i>	alsike clover	herb	FAC-	*
<i>Trifolium pratense</i>	red clover	herb	FACU+	*

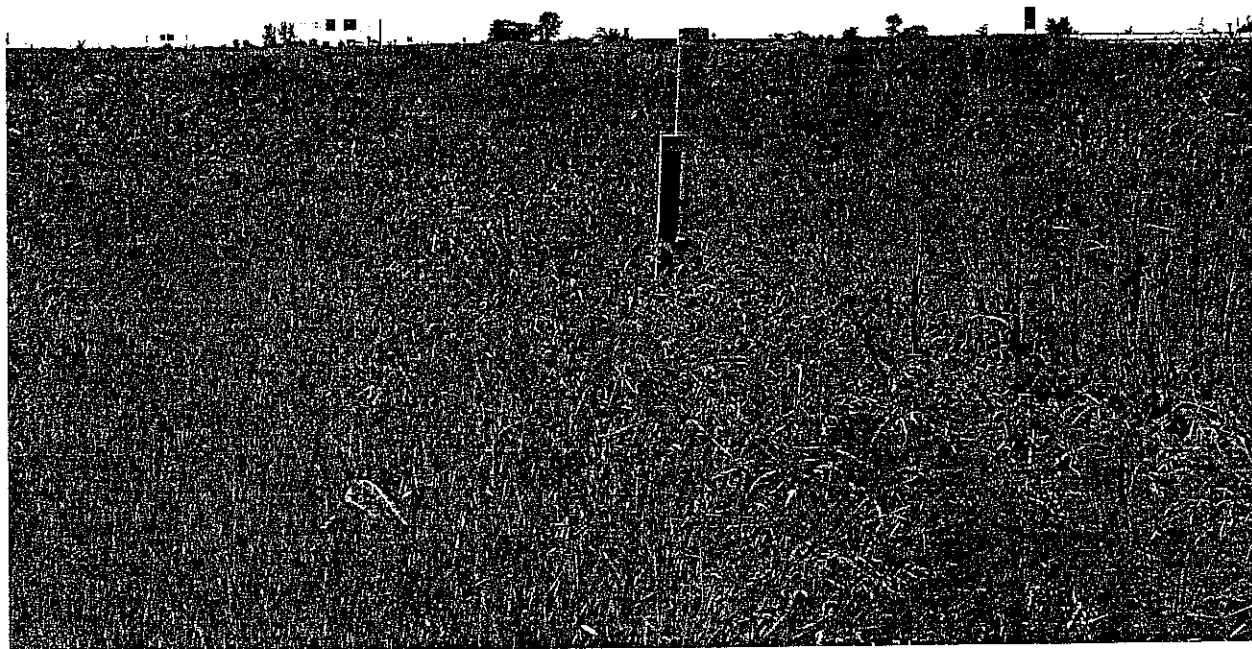
♦ Coefficient of Conservatism (Taft *et al.* 1997)

\*Non-native species

$$\text{mean C value (mCv)} = \sum C/N = 27/16 = 1.7$$

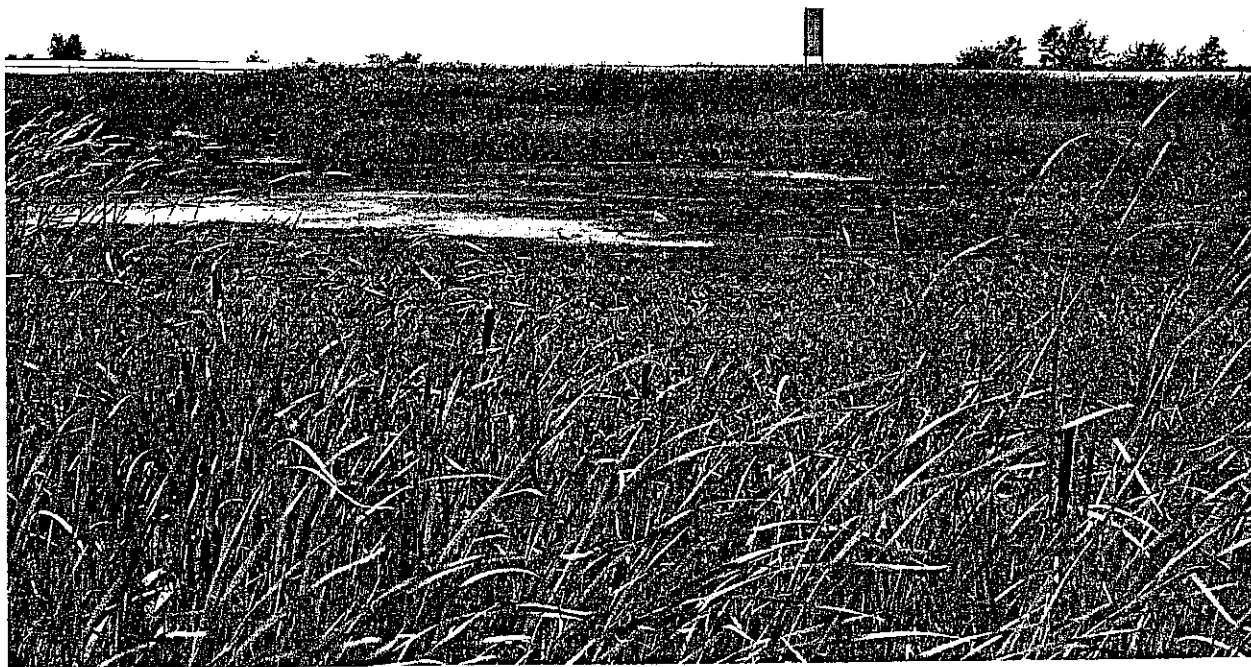
$$\text{FQI} = \text{mCv} (\sqrt{N}) = 1.7(\sqrt{16}) = 6.8$$

## **Appendix 2. Photos of wetland creation sites**

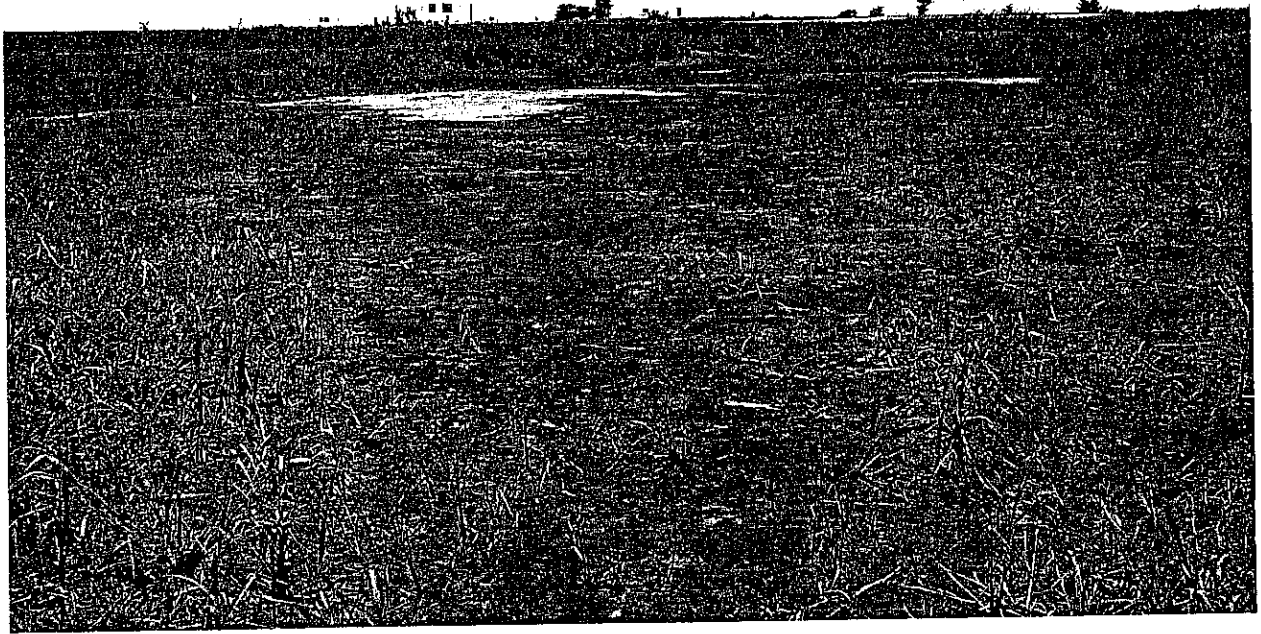


**Photo 1. View from north end of wetland, looking south. A line from the surface water monitoring station (RDS-2) in the foreground to the right side of the road sign in the background is approximately 205° bearing. This is the location of the baseline established for vegetative sampling.**

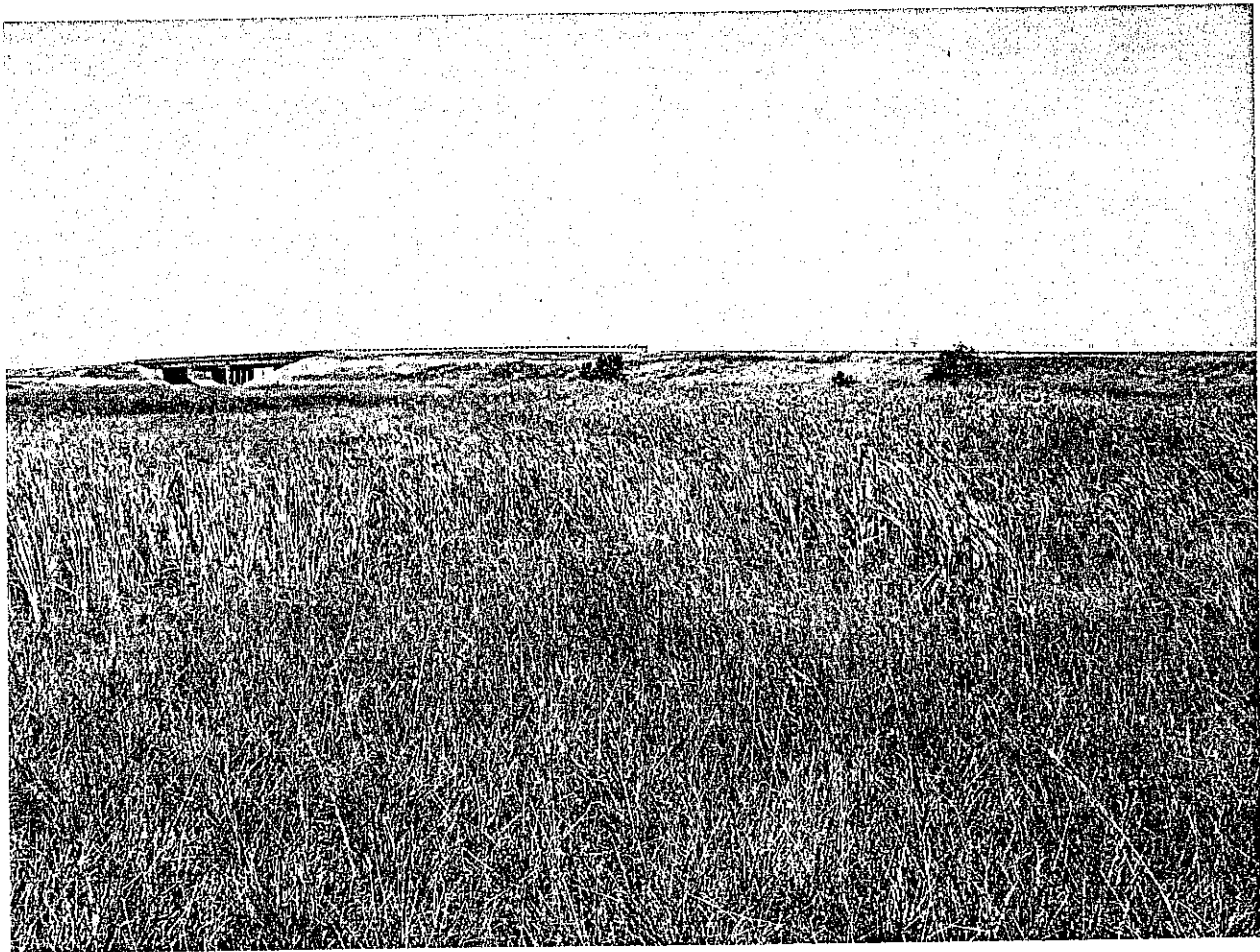




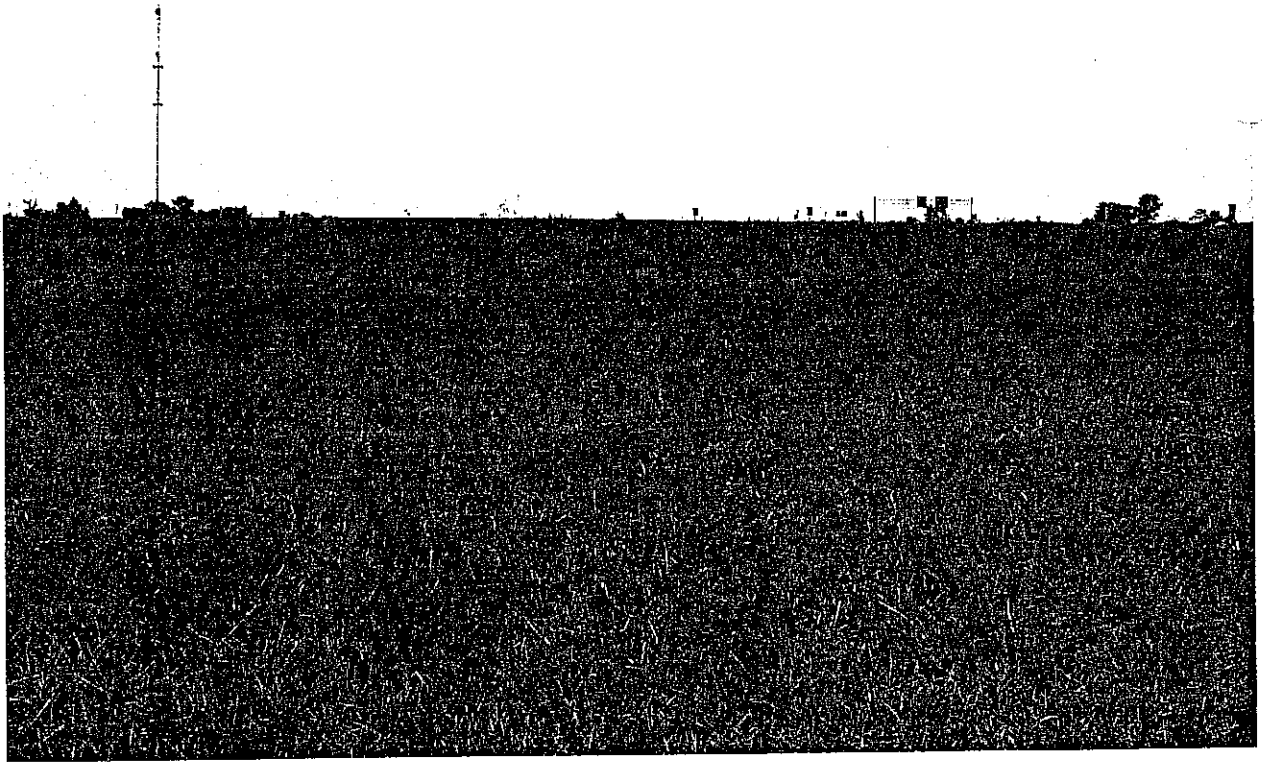
**Photo 2. View from east side of the wetland looking toward the *Typha angustifolia* patch near U.S. 51.**



**Photo 3. Looking south from the middle of the wetland near the north end.**



**Photo 4.** View from the south end of the wetland looking north. Note *Festuca pratensis* in the foreground. This is site #2, the non-native grassland.



**Photo 5. View of site #2, the non-native grassland from near the south end of the wetland.**



**Photo 6. View of *Typha angustifolia* patch looking east from along U.S. 51.**